

## Amendment to Claims

This listing of Claims will replace all prior versions and listings of claims in this Application.

### **Listing of Claims**

Claim 1. (CURRENTLY AMENDED) A circuit for reversible trimming of a matching resistor to a reference resistor wherein a material of the matching resistor material comprises a programmable resistance material, the circuit comprising  
a resistor bridge network comprising a the reference resistor and a the matching resistor;

a comparator circuit in communication with the resistor bridge network for comparing the resistance states values of the reference resistor and the matching resistor and for generating a comparing signal indicative of the difference between the reference resistor and the matching resistor; and

a pulse feedback circuit coupled to the resistor bridge network, the feedback circuit coupled to the comparator circuit and providing a pulsed electrical signal to the matching resistor corresponding to the comparing signal.

Claim 2. (CURRENTLY AMENDED) A circuit as in claim 1 wherein the programmable resistance material is selected from the group of materials consisting of a metal-amorphous silicon-metal material, a phase change material or and a thin film perovskite material.

Claim 3. (CURRENTLY AMENDED) A circuit as in claim 1 wherein the feedback circuit provides a the pulsed electrical signal to modify the resistance of the matching resistor, the pulse pulsed electrical signal having electrical characteristics taken from the group of electrical

characteristics consisting of the polarity, the amplitude or the and duration, and any combination thereof, corresponding to the comparing signal from the comparator circuit.

Claim 4. (CURRENTLY AMENDED) A circuit as in claim 1 wherein the pulsed electrical signal has a duration of between 100 fs and about 1000 ns, and an amplitude of between 0.1 V and about 100 V.

Claim 5. (CURRENTLY AMENDED) A circuit for reversible trimming of a matching resistor to a reference resistor wherein a material of the matching resistor material comprises a programmable resistance material, the circuit comprising a resistor bridge network comprising a the reference resistor and a the matching resistor;

a comparator circuit in communication with the resistor bridge network for comparing the resistance states values of the reference resistor and the matching resistor and for generating a comparing signal indicative of the difference between the reference resistor and the matching resistor; and a first transmission gate coupled between the resistor bridge network and the input of the comparator circuit;

a pulse feedback circuit coupled to the resistor bridge network, the feedback circuit coupled to the comparator circuit and comprising a second transmission gate;

wherein the timing of the first and second transmission gates is are controlled such that the first transmission gate is pulsed open for the comparator circuit to compare the resistance states values of the resistor bridge network and to generate a the comparing signal and the second transmission gate is pulsed open after the close of the first transmission gate to propagate the comparison comparing signal to the resistor bridge network.

Claim 6. (CURRENTLY AMENDED) A circuit as in claim 5 wherein the resistor bridge network includes is a resistance bridge comprising a reference resistor, a pulse adjustable resistor and two resistors with equal resistance, and wherein the matching resistor is a pulse adjustable resistor.

Claim 7. (ORIGINAL) A circuit as in claim 5 wherein the comparator circuit is a differential amplifier.

Claim 8. (CURRENTLY AMENDED) A circuit as in claim 5 wherein each of the transmission gate is gates consists of a single transistor.

Claim 9. (CURRENTLY AMENDED) A circuit as in claim 5 further comprising a delay circuit between the output of the comparator circuit and the an input of the pulse feedback circuit.

Claim 10. (CURRENTLY AMENDED) A circuit as in claim 5 wherein the a pulsed signal to pulse open the first transmission gate has a duration of durations between 5 ns to 100 ns.

Claim 11. (CURRENTLY AMENDED) A circuit as in claim 5 wherein the a pulsed signal to pulse open the first transmission gate has an amplitude of amplitudes between 0.1 V and about 100 V.

Claim 12. (CURRENTLY AMENDED) A circuit as in claim 5 wherein the programmable resistance material is selected from the group of materials consisting of a metal-amorphous silicon-metal material, a phase change material or and a thin film perovskite material.

Claim 13. (ORIGINAL) A circuit as in claim 12 wherein the metal-amorphous silicon-metal material comprises boron doped amorphous silicon layer located between two electrodes, one electrode being Cr and the other being V, Co, Ni, Pd, Fe or Mn.

Claim 14. (CURRENTLY AMENDED) A circuit as in claim ~~13~~ 12 wherein the phase change material comprises at least one chalcogen and one or more transition metals.

Claim 15. (CURRENTLY AMENDED) A circuit as in claim ~~14~~ 12 wherein the thin film perovskite material is selected from a group of materials consisting of colossal magnetoresistive materials and high temperature superconducting materials.

Claim 16. (CURRENTLY AMENDED) A circuit as in claim ~~15~~ 12 wherein the thin film perovskite material is selected from a group consisting of PrCaMnO (PCMO), LaCaMnO (LCMO), LaSrMnO (LSMO), LaBaMnO (LBMO), LaPbMnO (LPMO), NdCaMnO (NCMO), NdSrMnO (NSMO), NdPbMnO (NPMO), and LaPrCaMnO (LPCMO), GdBaCoO (GBCO) and mixtures and combinations thereof.

Claim 17. (CURRENTLY AMENDED) A method of reversible trimming of a matching resistor to a reference resistor wherein a material of the matching resistor material comprises a programmable resistance material, the method comprising

comparing the matching resistor to the reference resistor;  
generating a comparing signal indicative of the difference between the reference resistor and the matching resistor;  
applying a pulsed electrical signal to the matching resistor, the pulsed electrical signal corresponding to the comparing signal.

Claim 18. (ORIGINAL) A method as in claim 17 further comprising the repetition of the above steps until the resistances of the matching resistor and the reference resistor are matched.

Claim 19. (CURRENTLY AMENDED) ~~A circuit as in~~ The method of claim 17 wherein the programmable resistance material is selected from the group of material consisting of a metal-amorphous silicon-metal material, a phase change material or and a thin film perovskite material.

Claim 20. (CURRENTLY AMENDED) A circuit as in claim 17 wherein ~~a~~ the feedback circuit provides ~~a~~ the pulsed electrical signal to modify the resistance of the matching resistor, the pulse pulsed electrical signal having electrical characteristics taken from the group of electrical characteristics consisting of the polarity, the amplitude or the and duration, and any combination thereof, corresponding to the comparing signal from the comparator circuit.